

**What is claimed is:**

1. A functional test and demonstration apparatus for a fuel cell power system comprising:
  - a control device, for controlling the fuel cell power system and receiving at least one signal from the fuel cell power system;
  - a fuel cell stack having a hydrogen gas inlet, a hydrogen gas outlet, an air inlet, an air outlet, and a pair of output terminals for supplying a DC output voltage;
  - a load system, which comprises at least one electronic load connected to the output terminals of the fuel cell stack;
  - a hydrogen gas supply pipeline for conduction of a hydrogen gas from a hydrogen gas storage to the hydrogen gas inlet of the fuel cell stack;
  - an air supply pipeline for conduction of an air source from a blowing device to the air inlet of the fuel cell stack; and
  - a connection and display panel, which comprises a plurality of joints for connecting the control device, the fuel cell stack, the load system, the hydrogen gas supply pipeline and the air supply pipeline, and a plurality of indicating units being arranged on the connection and display panel for indicating an operation of the fuel cell stack.
2. The functional test and demonstration apparatus as claimed in Claim 1, wherein the load system comprises at least one electronic load with an adjustable power consumption.
3. The functional test and demonstration apparatus as claimed in Claim 2, wherein the electronic load is connected to the control device through a signal communication interface, so that the electronic load is controllable by the control device through the signal communication interface.

4. The functional test and demonstration apparatus as claimed in Claim 1, wherein the load system comprises at least one fixed load with a fixed power consumption.
5. The functional test and demonstration apparatus as claimed in Claim 4, wherein the load system is an AC electric load, and the functional test and demonstration apparatus further comprising a DC-to-AC converter for converting the DC output voltage supplied by the fuel cell stack into an AC output voltage for supplying to the AC electric load.
6. The functional test and demonstration apparatus as claimed in Claim 1, wherein the fuel cell stack comprises a temperature sensor for detecting a temperature of the fuel cell stack and thereby transmitting a temperature signal to the control device via an analog to digital converting interface.
7. The functional test and demonstration apparatus as claimed in Claim 1, wherein the hydrogen gas supply pipeline comprises a pressure regulating device for regulating a pressure of the hydrogen gas.
8. The functional test and demonstration apparatus as claimed in Claim 7, wherein the hydrogen gas supply pipeline further comprises a flow regulating valve for regulating a flow rate of hydrogen gas.
9. The functional test and demonstration apparatus as claimed in Claim 8, wherein the flow regulating valve further comprises a flow meter for measuring the flow rate of hydrogen gas.
10. The functional test and demonstration apparatus as claimed in Claim 1, wherein the hydrogen gas supply pipeline further comprises a pressure gauge for measuring a pressure of hydrogen gas.
11. The functional test and demonstration apparatus as claimed in Claim 1, wherein the hydrogen gas supply pipeline further comprises a thermometer for

measuring a temperature of hydrogen gas.

12. The functional test and demonstration apparatus as claimed in Claim 1, wherein the air supply pipeline comprises a flow regulating valve for regulating a flow rate of air supplied to the fuel cell stack.
13. The functional test and demonstration apparatus as claimed in Claim 12, wherein the air supply pipeline further comprises a flow meter for measuring the flow rate of air.
14. The functional test and demonstration apparatus as claimed in Claim 13, further comprising a cooling air supply pipeline which is connected to the air supply pipeline for conducting a part of the air drawn in by the blowing device to a cooling air inlet of the fuel cell stack, the flow regulating valve of the air supply system regulating the flow rate of air to the air supply pipeline and flow rate of air to the cooling air supply pipeline simultaneously, so that the amount of cooling air increases as amount of the reaction air to the fuel cell stack increases and thereby the fuel cell stack is appropriately cooled.
15. The functional test and demonstration apparatus as claimed in Claim 1, wherein the air supply pipeline further comprises a pressure gauge for measuring a pressure of the air.
16. The functional test and demonstration apparatus as claimed in Claim 1, wherein the air supply pipeline further comprises a thermometer for measuring a temperature of the air.
17. The functional test and demonstration apparatus as claimed in Claim 1, wherein the air supply pipeline further comprises a humidifier for humidifying the air.
18. The functional test and demonstration apparatus as claimed in Claim 1, wherein the connection and display panel comprises a fuel cell stack and gas supply connection region, an anode gas supply region, a cathode gas supply

region, a load display region and an auxiliary display region.